LOCAL MAC ADDRESS LEARNING IN LAYER 2 FRAME FORWARDING

ABSTRACT OF THE INVENTION

The present invention relates to a software-based method for reducing network bandwidth consumption and economizing on database space in MAC (media access control) address "learning." In networks, data is typically exchanged between communicating devices in the form of "frames." Frames include a source MAC address and a destination MAC address; a MAC address uniquely identifies a network device in a "Layer 2" communication protocol used in Ethernet and Token Ring LANs. In MAC address learning, the source MAC address in a received frame is recorded in an address database along with its port of origin to facilitate subsequent frame forwarding. In typical existing systems, a central "control point" (CP) processor learns and maintains a central database of MAC addresses. A number of distributed MAC address databases which are duplicates of the central database are also maintained. This centralized approach entails considerable bandwidth overhead and unnecessary duplication of MAC address databases at distributed local sites. According to the present invention, MAC address learning is performed locally rather than by a central processor. In a preferred embodiment, a MAC address database which is local to a

destination or target port for a data frame is updated by a local forwarding processor with the source address and port of origin of the data frame. This approach eliminates the unnecessary duplication of a central database at local sites and conserves space

5   because each local database contains only those addresses needed and used. Processing cycles are offloaded from the CP, which no longer needs to maintain a central database or download addresses to local databases. Further, bandwidth that would otherwise have been needed for MAC address learning is available for frame

10   forwarding.